

TR
730
H6

UC-NRLF



\$B 272 347

PRICE 6^D. NE

OST FREE 7



LANTERN SLIDE MAKING & EXHIBITING

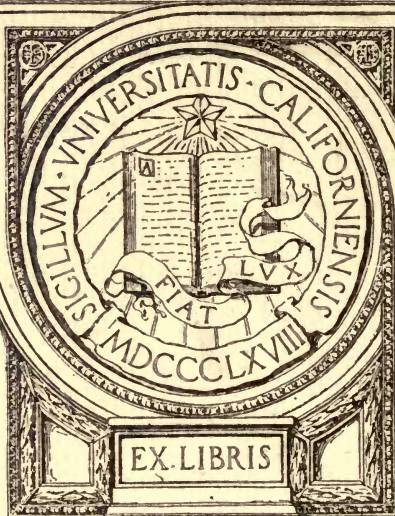
(ILLUSTRATED)
By John A. Hodges F.R.P.S.

No.4

CONTENTS:

- I.—The Gelatino-Bromide Process Described.
- II.—Making Slides by Reduction.
- III.—The Contact Method.
- IV.—The Development of the Slide.
- V.—Fixing, Intensifying, Reducing, Varnishing, etc.
- VI.—Printing in Clouds.
- VII.—Hints on the Management of the Lantern and the Exhibition of Slides.
- VIII.—Screens, Illuminant, Table and Final Hints.

GIFT OF

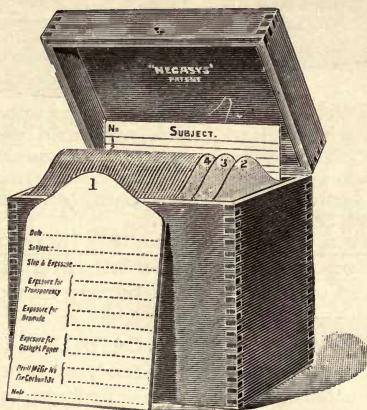


EX LIBRIS



. . The . . **“Negasys” File.**

The word “Negasys” is derived from *negative system*. It is a method of filing negatives that admirably adapts itself to every photographer's needs. Based on the practically universal card index and vertical filing systems, it is at once a complete, accurate, and practical method of keeping negatives. Whether the stock consists of 100 or 100,000, *every negative is accessible at all times*. The “Negasys” File allows the arrangement of the negatives to be changed when it is found desirable to do so. The “Negasys” File will hold as many negatives as an ordinary storage box three times the size, so the saving in space alone is enormous.



Negatives can be filed by localities, by subjects, by dates, numerically, or in any other way desired. Every Amateur or professional photographer who wants to put his hand on any negative at any time, should adopt the “Negasys.” *It will reduce chaos to order, pay for itself by the very time it saves.*

The Prices of “Negasys” File are as follows :

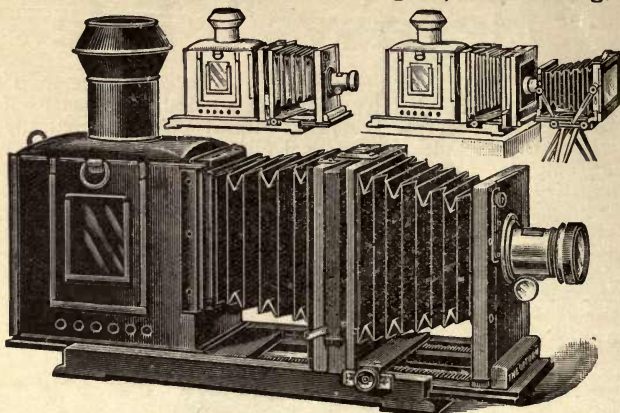
$\frac{1}{4}$ -pl. File-box fitted to take 50 negatives,	1/6
5 x 4 " " " " "	2/-
$\frac{1}{2}$ -pl. " " " " "	2/6
1-1 pl. " " " " "	3/9

Houghtons Ltd., *Manufacturers,*
88/89 High Holborn, W.C.

SOLD BY ALL DEALERS EVERYWHERE.

THE OPTURN ENLARGER.

Fig. 2, Lantern. Fig. 2a, for Reducing.



THE OPTURN ENLARGER is a new and up-to-date Enlarging Lantern, fitted with rack and pinion focus and rising front, the woodwork being made of walnut, polished, and the workmanship and finish is of the best, at the same time being a combination of Enlarging and Practical Single Lantern.

It is really a pleasure to use this instrument, either as an Enlarger or a Lantern, and all intending purchasers should see one of these before buying any other.

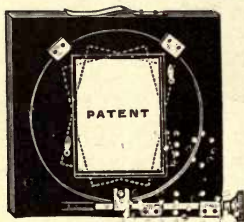


Fig. 3.

THE CARRIER (Fig 3.), which is a patent, is a special feature in the apparatus, as the operator can swivel the negative by simply working the milled head, by which means, if the image is not upright on the negative, it is easy to rectify this on the screen.

Sizes and Prices as follows:

		Without Objective.		Objective.	
Quarter-plate, with 5½ inch Condenser	.. ..	£3	5 0	£1	0 0
5×4 Plate, with 6½ inch Condenser	.. ..	£4	10 0	£1	5 0
Half-plate, with 8½ inch Condenser..	.. ..	£5	15 0	£1	15 0

Full particulars can be had on application to your dealer.

Sole Makers :

TURNER, SON & HOPE,

Photographic Apparatus Manufacturers (to the trade only),
BEAUMONT STREET, LIVERPOOL.

LETO-GASLIGHT

|| THE PERFECTION OF ||
|| GASLIGHT PAPERS ||

Made in Four Grades: SMOOTH, ROUGH, GLOSSY AND
CREAM CRAYON.

SPECIAL SAMPLE PACKETS

(Containing 12 pieces quarter-plate assorted grades
with developer),

POST **6d.** FREE.

Obtainable through all Dealers, or direct from

The LETO Photo Materials Co. (1905), Ltd.,
Rangoon Street, LONDON, E.C.



LETO BROMIDE AND GASLIGHT TONERS

For producing prints of Carbon-like quality on any
Bromide or Gaslight Paper, and especially suitable for

LANTERN SLIDES AND TRANSPARENCIES.

The Leto Toners are sold in three distinct sets:

SET No. 1: BROWN AND RED TONES.

No. 2: BLUE TONES. No. 3: GREEN TONES.

In boxes at **1/-** per set.

Trial sets containing one bottle of each colour **1/9** per set.

. . (Postage 4d. extra.) . .

X THE SIMPLE DESIGN X OF THE COOKE LENS

lends itself readily to ease of construction and adjustment. That is why we can eliminate just those errors which remain in other good lenses to mar their work.

We claim as a consequence that Cooke lenses have more uniformly flat fields, and give uniformly keener definition throughout their plates with full aperture than do other lenses of like focus and aperture. Therefore, they are eminently suited to lantern slide work.

Send a postcard quoting Z 472 for our new booklet.

TAYLOR, TAYLOR & HOBSON, LTD

STOUGHTON STREET WORKS, LEICESTER.

10, BERNERS STREET, LONDON,
433, BROADWAY, NEW YORK.

ALL PHOTOGRAPHERS

. . Professional and Amateur, should use the . .

P. O. P.'S

OF THE

SCOTTISH P.O.P. CO.,

— GREENOCK, N.B.

They are the newest and the best. Silver Chlorides, Matts, Bromides.

Our "**Wallace**" Brand of Self-Toning is a Marvel.

TRY IT.

Particulars and Prices on Application.

Address:—68 SOUTH ST., GREENOCK.

WATSON & SONS,

OPTICAL SCIENCE —
LANTERNS and SLIDES.

Watsons' "University Extension" Lantern.

For use with either

Oil . . .

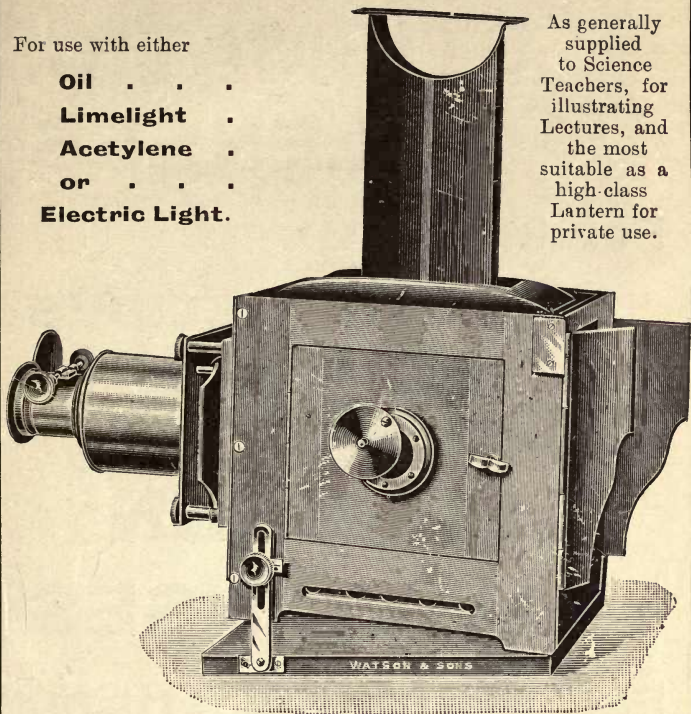
Limelight .

Acetylene .

or . . .

Electric Light.

As generally
supplied
to Science
Teachers, for
illustrating
Lectures, and
the most
suitable as a
high-class
Lantern for
private use.



Watsons' "University Extension" Lantern with finest quality polished mahogany body, double combination, achromatic objective, improved form of condenser, 4 wick oil lamp, slide carrier in strong travelling case.

COMPLETE .. **£6 15s. Od.**

A Classified List of

LANTERN SLIDES and LECTURE SETS

Free on application to—

W. WATSON & SONS, Optical Works, 313 High Holborn,

Branches:—

2 Easy Row, Birmingham; 16 Forrest Rd., Edinburgh.

LONDON, W.C.

— Use the —
Dallmeyer
STIGMATIC
LENSES

For MAKING
LANTERN SLIDES
AND

Dallmeyer's
LANTERN
LENSES

For SHOWING THEM,
AND ENSURE SUCCESS.

Catalogues and Booklets Free.

J. H. DALLMEYER, Ltd., 25 Newman St.
LONDON, W.



On the Derwent. (Copyright).

By John A. Hodges.

(A correctly masked and spotted Slide.)

LANTERN-SLIDE MAKING AND EXHIBITING.

(Illustrated.)

By **JOHN A. HODGES, F.R.P.S.**

Author of "Elementary Photography,"
"Practical Enlarging," "Photographic
Lenses," "Artistic Landscape Photo-
graphy," "Photography with Roll and
Flat Films," etc. etc.

LONDON :

Marshall, Brookes & Chalkley, Ltd.,
Harp Alley, Farringdon St., E.C.

214



Fig. 2. Under-developed slide.

J.A.H.

(For appearance of a correctly-developed slide, see Fig. 4).



J.A.H.

Preface.

THIS little instruction book is intended for the beginner, therefore both its aim and its small dimensions preclude the possibility of any attempt to deal with the subject exhaustively. With this object in view I have endeavoured to convey in the simplest possible language, and with, as far as may be, an absence of technical terms, sufficient practical directions to enable a novice by the easiest methods to master the art of making lantern slides. The gelatino-bromide process has been chosen as offering the fewest difficulties. Duplicate methods of working have been avoided not only on account of exigencies of space, but as tending to lessen the chance of confusing the reader.

The book also differs from those which have preceded it in that there is included within its covers directions for the exhibition of the slides as well as their production. These directions are, however, only intended for the unskilled amateur lanternist who may desire to exhibit his own transparencies to the best possible advantage before an audience of his relatives and friends, and it in no way competes with other treatises which deal with the subject from a more general standpoint. The amateur photographer who does not **exhibit** as well as **make** lantern slides loses no small measure of enjoyment from the practice of his hobby. This little treatise is dedicated in grateful recognition of many happy hours spent in acquiring the information, which it is hoped a perusal of its pages may impart, to those beginners in photography who may desire to learn not only how to make good lantern slides but to exhibit them to the best advantage.

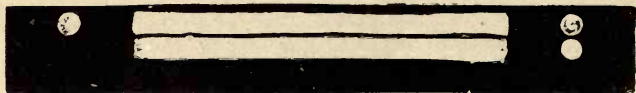
London, 1906.

JOHN A. HODGES.

"PRIMUS" Lantern Slide Specialities.

"PRIMUS" SPOT BINDING STRIPS.

Registered Design
No. 225080.



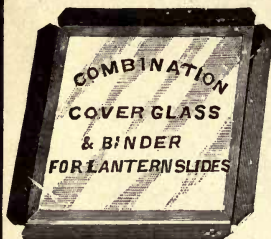
These binding strips are now universally known and are used by a large proportion of slide makers throughout the world; nothing more need be said, this speaks better than words as to their qualities.

PRICE per Box, 1/- (Sufficient for 100 Slides).

These strips may be had in the following colours:—

BLACK, BLUE, GREEN, RED or BROWN.

"PRIMUS" COMBINATION COVER GLASS & SPOT BINDER.



Slides may be mounted and finished ready for exhibition at a moment's notice. Makes the neatest possible lantern slides.

PRICE
1/- per box
(12 covers).



"PRIMUS" DETACHABLE MASKS.



An entirely new method of supplying the ordinary lantern mask. As is well known to users, great difficulty is experienced when selecting a mask from a box, as the remainder generally become disarranged. These masks are in pads, and being perforated on one side, they can be detached one at a time as required.

PRICE

Per pad of 50 masks (assorted or all one shape)

6d.

Made in two series: A, black both sides; B, black and white.

W. BUTCHER & SONS, Camera House,
FARRINGTON AVENUE, LONDON, E.C.
Supplied by all Dealers.

Lantern-slide Making and Exhibiting.



CHAPTER I.—Preliminary considerations. The Gelatino-bromide process described, etc.

Introductory.

MANY are deterred from taking up this most fascinating branch of photography because of its supposed difficulty, which, however, is more imaginary than real, as anyone who can develop a bromide print may, with every prospect of success, attempt the production of a lantern slide, for in no respect does the latter present any greater technical difficulty than the former. Both are positive prints, the composition of the image in either case, and also the method of producing it, being practically identical, the chief difference being that the bromide print is supported on a paper basis, and the lantern slide on glass.

Gelatino- bromide Lantern Plates.

Lantern slides may be made by a variety of methods, but for simplicity and ease of working, the modern gelatine process stands unrivalled, and it is the one that will be described in this book. Gelatino-bromide lantern plates are obtainable commercially packed in dozens like ordinary dry plates, and their quality is such that slides of the

highest excellence may be easily produced with them. They are usually made in two speeds, "rapid" and "slow," the former being used for black coloured slides, and the latter for producing various shades of brown. On some plates, however, either cold or warm hues can be obtained at will, according to the manner in which they are used. Lantern plates although much slower than negative plates are still extremely sensitive to white light, and the box containing them must only be opened in the dark-room, but instead of the ordinary ruby light a good yellow or orange light may be safely employed; this may be obtained by substituting orange glass for the usual ruby, or by using yellow fabric instead of the ordinary ruby medium. White light of any kind will instantly fog the plates.

**A few words on
the Negative.**

The character of the negative plays an important part in determining the quality of the slide. A skilful and experienced slide maker may be able to make a good slide from a poor negative, but the novice will find the difficulties of so doing almost insurmountable. Hence, the first essential to successful slide-making is the possession of good, or at any rate, suitable, negatives. Under-exposed and over-developed negatives that give hard black and white prints are the most difficult of all to deal with. A print from such a negative is unpleasing, but a lantern slide is an abomination. Very thin negatives present difficulty because of the liability to over-expose them, with the consequent production of thin images. Such negatives, however, may generally be considerably improved by intensification.

**How to Make
Uniform
Negatives.**

But the best plan is to aim at producing negatives of uniform character, and this desirable end will be more readily attained if a plate of good quality and uniform speed is selected, and the same developer used on all possible occasions. It is difficult to indicate the type of negative likely to give the best results, but as a rough guide it may be said that if any negative will give a good print on P.O.P. it will be equally satisfactory for lantern slide work.

**Removing
Defects.**

Any defects, mechanical or otherwise, should be removed from the negative before a lantern-slide is made from it, otherwise when magnified on the screen they will quite mar its appearance. White spots, scratches, or abrasions of the film can be stopped out with a fine sable brush and neutral tint water-colour. If the negative is otherwise a good one, and the reader should be unaccustomed to using the brush, the safer plan would be to send the negative to a skilful professional retoucher.

CHAPTER II.—Making Slides by Reduction.

Contact versus Reduction. THERE are two ways of making a lantern slide: i.e. (1) printing by contact, and (2) reducing in the camera.

The first is the simpler, but the latter presents no difficulty. Contact printing is recommended when the negatives are small, that is to say, $3\frac{1}{4} \times 3\frac{1}{4}$ size or less. The standard size of a lantern slide is $3\frac{1}{4} \times 3\frac{1}{4}$ inches, therefore it is obvious that any portion of a negative exceeding those dimensions cannot be included in the slide. If, then, it is desired to include the whole of the subject on a quarter-plate or any larger sized negative within the dimensions of a lantern slide the "reduction" method must be adopted.

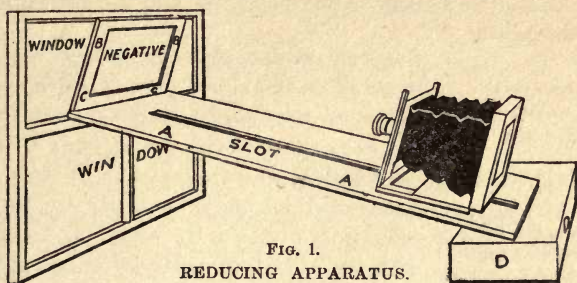
The two Methods Compared.

It is sometimes said that slides made by reduction are of superior technical quality when compared with those made by contact, but the author's experience does not confirm this opinion. If, however, the negative from which the contact slide is made is larger than the slide, it will be obvious that the whole of the original composition cannot be included, and this fact may be an advantage or otherwise, depending upon the degree of skill which has been exercised in arranging the composition of the picture.

Making Lantern Slides by Reduction.

To make a lantern-slide by reduction it is necessary to illuminate the negative evenly, and copy it in an ordinary camera on a lantern plate, the result being a reduced transparency, or lantern slide. A simple method of effecting this is to make, or have made, the apparatus shown in Fig. 1. AA is a board 3 ft. 6 in.

long, with a central groove $\frac{1}{4}$ inch wide. BB is a wooden frame screwed at right angles to the board provided with a nest of frames or carriers to take negatives of different sizes. Two hooks should be screwed in at CC, by which the apparatus may be supported at a window. The camera used to take the negatives may be employed to make the lantern-slides, but the dark slide must be fitted with a carrier to take $3\frac{1}{4} \times 3\frac{1}{4}$ plates. It is secured by means of the



ordinary tripod screw to the base of the apparatus, the groove permitting of the necessary adjustment. To secure even illumination two screw-eyes should be fastened to the upper sash of a window facing north, to which the apparatus can be hooked, a box DD placed underneath supporting the whole arrangement at a suitable angle. The carriers BB should have a vertical sliding movement to permit of the reduced image being accurately adjusted on the lantern plate. The correct distance of the lens from the negative must be found by experiment, great care being taken to focus the reduced image very sharply. A short focus lens will be found most convenient, one covering a quarter-plate will answer admirably, whatever be the size of the negatives. A longer focus

lens may be used, but as the distance between the lens and the negative will be greater the length of the baseboard must be increased. A small stop is not necessary, F11 or F16 giving, with a decently good lens, critical definition. Care must be taken, if the aspect is not northerly, that cast shadows do not fall on the negative. The correct exposure can only be learnt by experiment and practice, disturbing factors being the strength of the light, the aperture of the lens, the density of the negative, and the rapidity of the plate.

**Commercial
Slide-Making
Apparatus.**

Lantern slide-making cameras constructed on the above principle are articles of commerce, and those who are not expert in the use of tools will probably find it economical to purchase one of them.

**Reducing by
Artificial Light.**

Lantern-slides may be made by the reduction method by artificial light with the aid of an ordinary enlarging lantern, the light passing through the condenser being utilised for the illumination of the negative. The method of working is identical with that followed in the daylight system. The writer makes the majority of his slides in a similar manner and finds no difference in quality as compared with those produced by the daylight method.

**Substitutes for
the Condensing
System.**

Various methods of illuminating the negative which dispense with the employment of a condenser are from time to time advocated in the photographic press, but are all more or less open to objection. The only way to secure uniformity and certainty of results, combined with celerity of production is to employ a condenser, and all other systems should be avoided.

CHAPTER III.—The Contact Method.

Contact Printing.

An ordinary printing frame will be all the apparatus necessary for contact printing, but as in using it there is always a possibility of scratching the negative, the expenditure of half-a-crown in the purchase of a lantern-slide printing frame will be a wise investment. The negative is placed behind the springs with its film side against the cloth covered frame. If the hinged flap in the front be lifted and the frame held to the light, the position of the negative can be adjusted until the most satisfactory composition is secured, the springs holding it in any required position. A lantern plate is then taken from the box (the remainder of the plates being wrapped up and the lid replaced) placed face downwards on the negative and the flap, or door, closed and fastened. Everything is then ready for exposure.

Exposure and its Effect upon the Slide.

Now this question of exposure is of paramount importance; in fact, the secret of successful slide-making is in learning correctly to estimate the exposure required with a given negative and plate, coupled, perhaps, with the selection and proper use of a suitable developer. In making slides by contact the exposure question is simplified because artificial light of the same strength can be used, thereby securing that all-important factor, uniformity. If we always use the same source of light, keep the printing frame at a fixed distance from it, and find by

experiment that a certain exposure (for example 20 seconds) gives with a standard developer a certain result, we know that by working under precisely similar conditions we shall always be able to secure approximately identical results. If the reader will keep these facts steadfastly before him in making his early experiments in slide-making, half the initial difficulties and troubles which ordinarily beset the beginner will never appear.

The Exposure Board.

To assist in securing uniformity, an exposure board should be employed. This may be simply a piece of smooth deal, 4 feet long, with an upright piece at one end to support the frame, the source of light being placed at a marked position at the other end. The light may be either a gas flame, an oil lamp, an incandescent electric light of not more than 16 c.p., or an ordinary candle. The board should have lines plainly ruled across it at right angles to its length, and 6 inches apart. A slot should run down the centre of the board, so that the support may be adjusted at any distance from the light. A candle is perhaps the most satisfactory illuminant for the beginner, because of its uniformity. If an exposure of, say, 60 seconds proves too little, we have two courses open: either to reduce the distance between the light and the printing frame, or to increase the exposure. If the negative be dense, and as the light is a somewhat feeble one, we will adopt the former plan, and place the frame at the two-foot mark. Now in so doing we bear in mind the well-known rule in physics that the intensity of light varies as the square of the distance. If, therefore, we expose a second plate, again carefully counting 60 seconds,

we shall at the reduced distance really have quadrupled the exposure.

Aids to Correct Estimation of Exposure.

THE correct exposure for a given negative once ascertained, a note of all the conditions under which it was made should be at once entered in a copybook ruled off with the following headings, a brief reference to which will at any time subsequently enable one to secure an identical result:—

<i>Negative.</i>	<i>Light.</i>	<i>Plate.</i>	<i>Distance.</i>	<i>Exposure</i>	<i>Developer.</i>	<i>Remarks.</i>
No. 400 Sun-set effect.	Candle.	Ilford Special.	3 feet.	40 seconds.	Metol-hy- droquinone.	Rather dense slide

On the Choice of a Developer.

I HAVE incidentally referred to the importance of using a suitable developer, and the number being so large, the novice may easily be bewildered in making a selection. My advice is not to experiment with a number of different solutions, but to select a good formula and adhere to it. This recommendation, albeit time-honoured, cannot be improved upon, and moreover, to obtain the best result with any formula requires practice, experiment, and experience, conditions which should not weigh too heavily on the novice.

Various Formulæ.

I WILL now enumerate a few leading developers, and give working formulæ for their use, merely premising that there are many others which, though they may be as suitable for the purpose in hand, can certainly not be more so. From those given, the reader may make his selection, but having done so, we recom-

mend him to adhere to his choice, at any rate until some proficiency has been attained.

Hydroquinone. THIS, as an all-round developer, is certainly difficult to beat. With it can be produced slides of good quality, varying in colour from reddish-brown to black, according to the plate employed and method of using adopted. Its sole failing is a tendency to produce a harsh image, but this is generally due to insufficient exposure, or an unsuitable formula. Many formulæ contain an excess of both hydroquinone and bromide, therefore the proportions here given should be adhered to. Caustic potash is generally recommended as the accelerator, but its use also tends to harshness; carbonate of soda is pleasanter to use, and gives a better rendering of half-tones. The following formula has been used by the author for several years, with every satisfaction:—

No. 1.

Hydrokinone	...	...	...	60 gr.	49 grms
Sulphite of soda (anhydrous)	...	...	...	1 oz.	30 grms
Citric acid	...	...	...	10 gr.	1 gram
Bromide of potassium	...	..	...	10 gr.	1 gram
Distilled water	...	...	...	10 oz.	300 cc

No. 2.

Carbonate of soda	...	...	...	1 oz.	30 grms
Distilled water	...	...	...	10 oz.	300 cc

Mix in equal parts just prior to using.

Metol. A GOOD developer for black-coloured slides. Unlike hydroquinone its characteristic feature is softness, and unless development is sufficiently prolonged, the slides are apt to

lack contrast, but the colour is a very pure black. With some people its employment produces an irritation of the skin; if this occurs it should not be used. A good formula is the following:—

No. 1.

Metol	...	...	...	70 gr.
Metabisulphite of soda	...	...	...	30 gr.
Bromide of potassium	...	...	...	15 gr.
Distilled water	...	...	...	10 oz.

No. 2.

Carbonate of soda	...	...	...	1 oz.
Distilled water	...	...	...	10 oz.

For use mix in equal parts.

Metol-Quinol. METOL works best for lantern-slide purposes when combined with hydroquinone, and a capital all-round developer can be made by taking 1 part of the mixed hydroquinone formula and mixing it with half its bulk of the mixed metol formula.

Rodinal. THIS is a very simple developer for lantern slides, the concentrated commercial solution merely requiring dilution with water before use. The colour produced with most plates is a pleasing warm black.

Ortol. ORTOL is also an excellent lantern-slide developer, giving great clearness and delicacy of image. The formula used by the writer is as follows:—

No. 1.

Ortol	...	...	...	70 gr.
Metabisulphite of soda	...	...	...	40 gr.
Distilled water	...	...	...	10 oz.

No 2.

Carbonate of soda	...	...	...	1 oz.
Sulphite of soda (anhydrous)	...	...	...	1 oz.
Bromide of potassium	...	...	...	10 gr.
Distilled water	...	...	...	10 oz.

For use mix in equal parts. The colour is a pleasant warm black.

Pyro. This is the best developer for producing warmth of colour in lantern slides, but it is not suitable for the production of black tones. Two solutions are required:—

No. 1.

Pyrogallol	...	...	...	20 gr.
Citric Acid	...	...	...	5 gr.
Potash metabisulphite	...	...	...	60 gr.
Distilled water	...	...	...	10 oz.

No. 2.

Ammonia (880°)	...	...	...	70 minims
Bromide of ammonium	...	...	...	20 gr.
Distilled water	...	...	...	10 oz.

Mix in equal parts, and use fresh solution for each slide.

Effect of Temperature on Developers. LANTERN-SLIDE making being essentially winter work, it is necessary to keep the solutions at a proper working temperature, i.e., 60 deg. Fahr., or thereabouts. The use of solutions at too low a temperature is a frequent cause of failure and uncertainty of result. As the temperature falls below 60° the solutions work slower, until when nearing 32° many refuse to develop at all. Notably is this the case with hydrokinone, the temperature of which should never be below 60°. The cold solutions can

easily be raised to the required temperatures by standing the measure containing the mixed developer in a bowl of hot water, and dipping a small laboratory thermometer into the solution until it registers from 60° to 65° Fah.

On the Choice of Developers. Many new developers are constantly being introduced, the merits of which are greatly extolled for slide-making, but the reader is recommended to confine his attention to the metol-hydroquinone formula (page 11) for black and cold tones, and the pyro formula (page 12), when greater warmth of colour is required. In the experience of the writer, who prefers these developers to all others, these have proved themselves capable of producing the very finest results.

CHAPTER IV.—The Development of the Slide.

Development. The plate having been exposed, either by contact or in the reducing camera, will then be ready for development, and as its treatment will be identical, the following instructions will apply in either case:—

Procedure. Use a deep $3\frac{1}{4} \times 3\frac{1}{4}$ porcelain dish for developing, and always keep it clean and free from stains, with an occasional rub with a cloth dipped in dilute hydrochloric acid. Mix two ounces of the developer at the moment it is required, in a clean measure. Less solution can be used, but it is false economy. Place the exposed lantern plate in the dish, taking care not to touch the film, or finger marks will appear. The lantern plate or slide should always be held by its opposite edges, and never between the thumb and fingers. Do not, as is sometimes advised, give the exposed slide a preliminary soaking in water; to do so generally produces bubbles, which ultimately appear as white spots on the screen. Tilt the dish slightly and pour on the developer slowly but without hesitation, at the same time bringing the dish level so that the developer flows across the plate in a continuous and even wave. If the plate is only partially or unevenly covered, it will show development marks when finished, so it is essential to learn how to perform the operation properly. It is really a very simple one.

Developing Hints. If the exposure has been correct, the image should appear in about a minute. It should come up slowly, and the detail should appear gradually and evenly,

the picture gaining in strength as development progresses. The slide should be sufficiently dense in from three to five minutes, but in this respect much depends upon the plate, and the character of the negative.

Signs of Under-Exposure.

If the image does not appear within two minutes, the plate has probably been under-exposed. In such a case another exposure should be made, as it is a waste of time to attempt to make a good slide from an under-timed plate. *Never force the image by adding accelerator.* Keep the proportions in which the developer is mixed constant, and compensate any error by modifying the exposure, not by altering the strength of the developer. Working in this systematic way good results will soon be attained, and the making of lantern slides will indeed be a pleasure.

Signs of Over-Exposure.

If the image should appear almost as soon as the plate is covered with the developer, over-exposure is indicated. In such a case immediately pour off the developer, and fill up the dish with water to which from 30 to 50 minims of a 10 per cent. solution of bromide of potassium have been added. If the exposure has not been unduly excessive, the development will continue and the plate gain in density slowly. At the end of, say, ten minutes, the plate can be rinsed and fixed, and the result may be a good slide. Such treatment, however, always tends to warmth of colour and softness of contrast, and unless these attributes are desired it is always preferable to give just sufficient exposure to produce with normal development a good technical slide.

"Cold" Tones. IN the foregoing instructions it has been assumed that Metol-hydroquinone and a cold-tone plate have been employed with a view to the production of a good engraving black slide. As the procedure when a "warm tone" plate and pyro is employed is somewhat different, that method of working will now be described.

"Warm" Tones. As a rule, "warm tone" plates are much slower than those intended for "cold tones," therefore a longer exposure will be necessary. The developer should only be mixed when required, and fresh solution used for each plate, otherwise stains and markings will probably appear. With pyro a longer time is usually required for the appearance of the image, and development proceeds more slowly, though this does not apply with equal force to all makes of plates. The appearance of a pyro developed plate as it lies in the developing dish is very deceptive, the image by reflected light being apparently feeble and faint. The progress of development can only be followed by holding the plate to the lamp and examining it by transmitted light. A pyro-developed slide rarely *looks* so dense as one developed with metol-hydrokinone, although in reality it may be more so. The advice previously given as to adding accelerator to assist a flagging developer applies with greater force to pyro than almost any other developer. If good warm tones are desired the *exposure must be sufficient to enable a normal developer to bring out the image, and any addition of accelerator, although it may hasten its appearance, will ruin the colour of the slide and spoil its appearance.*

When to Stop Development.

It is difficult to describe the moment when development should be stopped, particularly with pyro, as the appearance of the image is deceptive. A safe rule, perhaps, is to remove the slide when it appears to be *slightly over-developed*, and just as it commences to veil. A slight veiling is necessary because the *apparent* density is greater than the *real* density, the image appearing considerably thinner *after fixation*. Just how much allowance should be made for this tendency can only be learnt by practice, but the beauty of the finished slide will to a large extent depend upon its correct estimation.

The Importance of Correct Exposure.

In the hope that it may assist the novice in recognising the characteristic appearance of an under, over, and correctly exposed slide, three reproductions are here given. (Figs. 2, 3, and 4). Although success is by no means difficult of attainment, good technique can only be acquired by constant practice and a careful observation of the result produced under certain known conditions, and it was for this reason that we advised the keeping of an exposure note-book.

CHAPTER V.—Fixing, Intensifying, Reducing, Varnishing, Etc.

The Fixing Bath. For fixing use a clean, freshly-mixed solution of hypo of the following strength:—

Hyposulphite of soda	...	...	4 oz.
Water	...	...	12 oz.

No other chemical should be added to the fixing bath. Leave the plate in the solution for not less than 10 minutes, for the permanence of the slide depends mainly upon thorough fixation and washing. The latter operation must be performed in running water; soaking in still water, however, frequently it may be changed, is, in the writer's opinion, always a doubtful method of removing hypo. Never use hypo eliminators; running water is the only safe and effectual way of removing the last traces of hypo from the film.

The Disadvantages of Toning Methods.

Very beautiful colour effects can be obtained on lantern plates by toning, but such methods are not to be recommended on account of their want of permanence. The range of colour obtainable by simple development is so wide that there is really no need to resort to other and less permanent means of obtaining it. In particular, processes which involve bleaching the slide with mercury, or the use of uranium should be carefully avoided.

Improving Dense Slides.

Sometimes a slight error of judgment in developing may lead to the slide being either too dense or too thin. Both these defects can be remedied; the

first by reducing, and the second by intensification.

Reducing Bath. To reduce a slide prepare the following solutions:

No. 1.

Ferricyanide of potassium	...	...	...	1 oz.
Distilled water	...	...	...	10 oz.

No. 2.

Hyposulphite of soda	...	...	...	1 oz.
Water	...	...	...	10 oz.

To one ounce of No. 2 add 10 minims of No. 1 and pour over the slide, which should have been previously fixed and washed. The action of the reducer is rapid, and its effect upon the slide must be carefully watched; directly the density is sufficiently reduced the slide should be well washed in running water for half an hour. Most slides, especially if they are slightly veiled, are improved by a brief immersion for, say, half a minute in this reducer, the treatment having a very brightening effect upon the slide. Care, however, must be taken not to allow the action to proceed too far, or the more delicate detail will be eaten away.

The Improvement of Thin Slides.

Slides which are too thin to require the converse treatment, namely, intensification. The intensifier usually employed is the mercury one, but slides so treated are of doubtful permanence. The following method with silver nitrate is very reliable, but scrupulous cleanliness is necessary to ensure success.

Intensification.

No. 1.

Pyro	...	...	...	60 gr.
Citric acid	...	...	...	160 gr.
Distilled water	...	...	...	10 oz.

No. 2.

Nitrate of silver 100 gr.

Distilled water 3 oz.

Add 6 minims of No. 2 to one ounce of No. 1 just before use. The slide must be freed from every trace of hypo before treatment, or stains will result. Intensify in a dish kept for the purpose. If the intensifier becomes turbid before sufficient intensity is obtained throw it off and mix some fresh. *Distilled* water only must be used. When the slide is sufficiently dense wash, and replace in the hypo bath for a few minutes, then wash again to remove hypo and dry.

Hints on Drying Slides.

In drying lantern slides be very careful to avoid dust specks, which, although almost invisible, will prove a great eyesore and quite mar the result when the enlarged image is projected on the screen. A large empty box covered with a piece of fine muslin in lieu of a lid is a convenient method of drying slides and at the same time avoiding dust.

How to Varnish a Lantern Slide.

Directly the slide is dry it should be varnished and bound up. Varnishing a gelatine slide is usually considered to be unnecessary, but it imparts great transparency to the shadows, and adds to the brilliance of the slide as well as affording protection from atmospheric influences, and thereby conducing to its future permanence. Any good negative varnish may be employed. Its application requires a little knack which, however, is soon learnt. Slightly warm the slide, then hold it quite level, and pour on a pool of varnish about the size of a five-shilling piece in the centre, cause it to flow, by

slight tilting, from corner to corner, and pour the surplus back into the bottle. Then, giving the slide a gentle rotary movement, hold it over a gas or lamp flame till the varnish sets hard, which it will do in about a minute.

**Binding and
Finishing.**

Lantern slides are protected from injury by binding them, film side inwards, in contact with a piece of glass of the same size, a mask or disc of opaque paper with a square or oblong opening being interposed to improve the pictorial effect. Cover glasses of various qualities can be bought at the dealer's, the best should always be chosen, as specks and bubbles are frequently met with in the commoner kinds, and quite spoil the appearance of the slides. Spoilt lantern plates should never be destroyed, for if the films are cleaned off and the glass carefully polished they make good cover glasses. The bought glasses, by the way, also require cleaning, and the following is a good cleaning and polishing mixture:

**Cleaning Cover
Glasses.**

Tripoli	...	...	...	...	1 oz.
Methylated spirit	...	..	...	...	1 oz.
Liquid ammonia	...	...	...	...	1 drm
Water	...	...	...	...	3 oz.

**Finishing the
Slides.**

A box of binding strips, some registration dots, and some masks must also be procured. The latter are discs of opaque paper in which openings of various sizes have been cut. Those intended for contact slides have larger openings than those

to be used for reduction slides, the image in the former case occupying the whole of the plate. Select openings with square and not cushion shaped corners, and avoid ovals and circles, which seldom look well on the screen. The binding strips, which are simply narrow strips of thin gummed paper, should be cut into pieces $3\frac{1}{8}$ long.

**On the Choice
of Masks.**

Choose a mask which appears to suit the subject best; should it hide part of the picture, never mind if the pictorial effect is thereby improved. Try several sized openings before deciding which to employ, for a little time and consideration spent in this way will greatly add to the pictorial quality of your slides. Place the selected mask squarely on the varnished face of the slide, then put a clean cover glass in contact like a sandwich. Lay four binding strips on a clean piece of newspaper and pass a stiff brush dipped in starch paste over them, for the gum is seldom sufficiently adhesive to stick unaided. Holding the lantern plate and cover glass between the finger and thumb, place the edges carefully in the centre of and parallel with the sides of the strip. The strip will adhere to the edges of the glass; raise the slide and carefully press the edges of the strip in contact with the glass with the thumb and finger. Do the same with the three remaining sides, and when two of the white dots have been stuck to the top corners of the *cover glass*, the slide will present the appearance shown in the frontispiece, and be ready for exhibition. When exhibiting, the slide is put in the carrier with the dots downward and next the condenser; it will then always appear correctly on the screen.

**Hints on
Storing Slides.**

The finished slides should be stored in boxes in a dry place, for damp will sooner or later cause their deterioration. If, however, they have been carefully made according to the foregoing directions they should retain their beauty indefinitely. Sets should be numbered consecutively on the registration dots, and the title of each slide may either be written on a slip of paper neatly pasted on the cover glass, or on the top of the mask itself, before the slide is bound up. In the latter case white ink should be used, which can be made as follows :

**Ink for Writing
the Titles.**

Oxide of zinc	...	...	...	$\frac{1}{4}$ oz.
Glycerine	...	...	...	$\frac{1}{2}$ drm.
Water,	quant. suf.			

These ingredients should be rubbed together in a mortar, sufficient water being added to allow the mixture to flow freely from the pen.

CHAPTER VI.—PRINTING IN CLOUDS.

**How to Print
Skies in a
Lantern Slide.**

No landscape slide, however good otherwise, should be allowed to pass muster, if it shows a blank white space in lieu of sky. The simplest method of adding the necessary clouds is to print them on a separate plate, which is used instead of a cover glass. In this case care must be taken that the clouds are lit from the opposite direction to the lighting of the landscape, so that when placed film to film the lighting may appear correct.

**Manipulative
Details.**

The cloud slide may be made by either contact or reduction, but the sky, of course, should harmonise with the landscape. During exposure shade the lower or foreground portion of the sky negative, so that it will merge imperceptibly into the horizon, as any hard line of demarcation would show when the slide was bound up. If the sky is carried too low down the plate, or appears to be too pronounced, dip a camel-hair brush in the reducer solution (see page 19) and apply it to the part which it is wished to reduce or lighten, taking care not to allow the action to proceed too far. It is best to work near a tap, so that the plate may be washed directly the reduction has been carried far enough. Care must also be taken to use the same kind of plate and developer for both sky and landscape, in order that both may be the same tone or colour. Fig. 5 shows a plain slide with white sky. Fig. 6 the sky cover glass; and Fig. 7 the two combined.

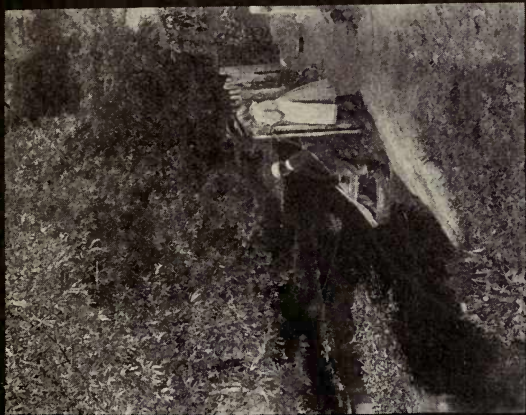


Fig. 4. Correctly-developed Slide.

J.A.H.

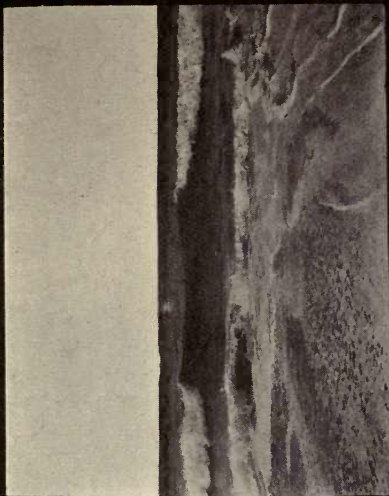


Fig. 5. Slide with sky blocked out.

J.A.H.

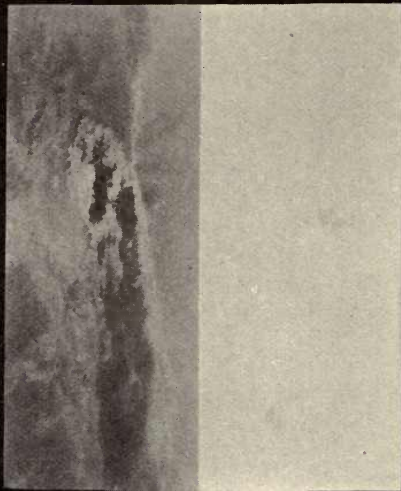


Fig. 6. Sky Cover Glass.

J.A.H.



Fig. 7. "Surf and Sunshine."
(Complete slide with sky on cover glass.)

J.A.H.

CHAPTER VII.—Hints on the Management of the Lantern and the Exhibition of the Slides.

Preliminary Considerations.

HAVING, by carefully following the foregoing directions, succeeded in making a series of good lantern slides, we must next consider how they may be exhibited to the best advantage. This involves the possession of an optical, or as it was formerly called, magic, lantern, with its accessories, and a suitable lantern screen.

The Principles of Optical Projection Explained.

These directions for the proper manipulation of the lantern will be more readily followed if the novice be familiar with the principles on which it is constructed. Referring to Fig. 8, A is the body, BB the condenser, C the illuminant, D the stage, E the front, and F the projecting lens. The body AA is usually made of metal, tin, or iron, and sometimes of wood lined with metal. The object of the body is to enclose the illuminant and prevent light

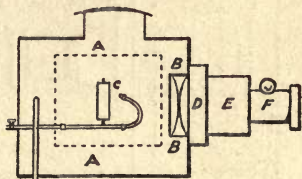


Fig. 8. Modern type of lantern.

other than that transmitting the image from passing out into the room and detracting from its brilliance. The function of the condenser B is to condense as many rays of light as possible from the illuminant C through the slide, which latter is placed in a frame, or carrier, in the slide stage D, the enlarged image being projected by the objective F, which is fitted into the front E.

The most important parts of the lantern are (1) the lens, and (2) the illuminant, and these deserve special consideration.

**Lantern Lenses
and their
Selection.**

First, as to the lens. This should be of large diameter, and of good quality. For home exhibition a good portrait lens (and such can often be obtained secondhand at a nominal cost) will give most excellent results. All modern lanterns are fitted with lenses of this type, but necessarily in cheap instruments lenses of high quality cannot reasonably be expected. The older lanterns of the phantasmagoria type, shown in Fig. 9, were often fitted with a single lens, but this, besides giving a comparatively feeble image, gave very poor definition. It may, in fact, be taken as an axiom in optical projection, as in photography, that the better the lens the better the picture. It is sometimes possible to buy a second-hand lantern at a very

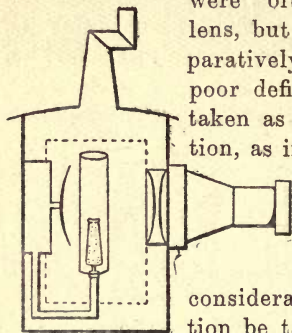


Fig. 9. Old or phantasmagoria, type of lantern.

considerable reduction, if the precaution be taken to buy only a modern instrument, as shown in Fig. 8, and not one of the phantasmagoria pattern, Fig 9, which is now obsolete, and incapable of giving first-class results.

**Hints on the
Choice of an
Illuminant.**

In choosing the illuminant the reader must be guided by local circumstances, and by the nature of the entertainment which he proposes to give. If he only desires to use the lantern at home

a small disc will suffice, and a very powerful illuminant will not be necessary. On the other hand, if he aspires to giving public exhibitions or lantern shows, something in the nature of the lime-light or the electric arc-light will be required. Perhaps as the choice of an illuminant is so wide, it may be helpful to refer briefly to those in common use.

Oil Lamps. These are constructed with three, and sometimes four, parallel wicks.

If of good quality and properly trimmed they give a bright picture of from four to five feet in diameter, and are very convenient and suitable for home use. The best oil should always be used, the surplus oil being poured out of the container after use, and the wicks dried, removed, and replaced. The latter must be kept carefully trimmed and straight. After lighting turn low until the lamp is thoroughly warmed, then raise by degrees. Wipe up any oil accidentally spilt in filling the lamp. If these precautions are observed the lamp will burn well and will not smell. Never put camphor in the oil; it clogs the wicks, and increases the tendency to smoke.

Incandescent Gas. Where house gas is available, an incandescent burner and mantel is a convenient and satisfactory illuminant for home exhibitions, but, like oil, is out of the question for public exhibitions. The burner is clamped on an ordinary lime-light tray, and must be adjusted so that the light is central with the optical system. A reflector, though often used, is practically useless for this form of light. It gives a disc about equal in size to that thrown by an oil lamp, but the colour is whiter and more effective.

Incandescent Spirit Lamps. Lamps on the same principle, but burning vapourized methylated spirit instead of gas, have lately been introduced for lantern use. Some of these give as much as 150 candle power, and produce a bright, well-lighted disc. Their only drawback is that they require more attention in correctly adjusting the flow of spirit, and sometimes an overflow of ignited spirit occurs. The sides of the lantern tray should be about $\frac{1}{2}$ in. deep, so as to prevent any danger in this respect. When working properly a well lighted disc of seven or eight feet in diameter can be obtained.

Size of Disc. The sizes here given are merely approximate, and I have taken a high standard of efficiency; if one is content with a less brilliant picture the size of the disc in each case can be considerably increased, but a small picture well lit is usually far more satisfactory than a large one feebly illuminated.

Incandescent Electric Light. Those readers whose houses are fitted with electric light will naturally desire to avail themselves of this convenient method of illuminating the lantern. A specially made incandescent lamp, in which the filament is wound in the form of a helix or coil can be obtained, giving a light of from 32 to 64 c.p., but its performance is not equal to that of a good oil lamp, and the efficiency of the lamp also impaired by the gradual darkening of the bulb.

The Nernst Lamp. This is an almost ideal form of illuminant for home use and for small screens in public halls where the electric current is available. The carbon filament is re-

placed by a strip of some refractory material, which becomes intensely luminous on passing the current through it. It possesses the great advantage of not requiring a vacuum. Therefore, the darkening of the enclosing globe does not occur. The lamps are not costly, and consume very little current. They are obtainable from about 120 c.p. to 300 c.p.

The Arc Light. This light, in its more powerful forms, gives a candle power of from 500 to 3,000 or more, and is only suitable for large halls and very big discs. It gives better definition and has more penetrating power than the most powerful lime-light, but some exhibitors dislike the cold hue it gives to the projected image. Lamps of this character are unsuited for home use and small discs, and must not be attached to the ordinary house installation, as they require special wiring and connections.

Small Arc Lamps. Quite recently, however, small arc lamps have been introduced which give a light of about 150 to 200 c.p. which, when used in conjunction with a suitable resistance, may be safely attached to the house supply. The only drawback to these lamps is that not being provided with an automatic feed, the adjustment of the carbons has to be performed by hand; otherwise their performance is excellent.

The Limelight. The lime-light system may be regarded as the sheet anchor of the lanternist, for when used in conjunction with compressed gas in cylinders, it may be used anywhere and under any conditions. The amateur should never attempt to make his own gas, but should always use cylinders, which are safe, con-

venient, and efficient. — The principle of the lime-light is very simple: a stream of oxygen under pressure is caused to blow through a flame of hydrogen or spirit and impinge upon a disc of lime, which, under the great heat, becomes incandescent and produces the lime-light.

**Oxy-calcium
Lamp.**

In the oldest form of jet, now practically obsolete, a spirit lamp takes the place of the hydrogen flame. This form of jet is rather difficult to manage, and gives less light than any other, but only requires one bottle or bag of oxygen. It gives an excellent light for home use and also for small screens in public.

**The Blow-
through Jet.**

In this pattern a fine stream of oxygen is blown through a large loose flame of hydrogen or house gas. It is the most popular form of the lime-light and is easily managed, and as the intensity of the light can be regulated, it is suited for either home use or public exhibitions. The intensity varies from 150 to 250 c.p. or over. Care must be taken to connect the respective gases to the proper tubes. In good jets the hydrogen connection is painted red, and the oxygen black. Before making the connection turn off both jet taps, a regulator, of course, being used on the oxygen bottle; if not, the oxygen tap must be left on and the supply of gas regulated from the bottle, otherwise the tubes would be blown off by the accumulating pressure. First turn on the house gas and slowly rotate the lime cylinder which should previously have been placed on the lime pin, until it is uniformly heated. Then on gradually turning on the oxygen the lime will become incandescent, the distance of the latter from the oxygen jet or

nipple being adjusted until the maximum light is obtained. Too great a pressure of oxygen will lessen the light and cool the lime. When the adjustment is accurate the light will burn noiselessly. If any whistling occurs too much oxygen is being consumed. The lime will require turning at intervals, as it becomes deeply pitted or burnt, so as to expose a fresh surface to the flame.

The Mixed Jet. This is the most perfect and powerful form of the lime-light, an intensity of 800 to 1,000 candles being obtained under favourable conditions. It requires more experience to manage it successfully and produce a good result than either of the other forms, and therefore is not so well suited to the needs of an amateur. Both the hydrogen and the oxygen are made under pressure, regulators being used on each bottle. The oxygen regulator must never be used on the hydrogen bottle, and *vice versa*. To obviate mistakes hydrogen regulators are always painted red, as are also the bottles containing that gas, oxygen bottles being invariably painted black. The compressed gas system is absolutely safe when these conditions are observed; the only accidents which have occurred in the past being due to their having been disregarded. To manipulate the mixed jet make the connections as before, and observing the same precautions, then turn on the hydrogen or red tap slightly and light the jet so that the flame plays softly on the lime. For the mixed jet, by the way, use *hard* limes, and for the blow-through *soft* limes. When the lime is warmed turn on the oxygen slowly till the lime becomes incandescent, then adjust the pressure of the two gases until the maximum of light is obtained.

CHAPTER VIII.

**The Lantern
Screen.**

THE effect of the projected slide will to a very large extent depend upon the nature of the screen. Some people will pay a large price for a lantern and think that any old sheet or a piece of calico will do to show the slides upon. No greater mistake could be made, especially when comparatively feeble illuminants are employed.

**Opaque
Screens.**

The more opaque and the whiter the screen the better the effect. For home use and small discs a large sheet of millboard, which can be obtained about 4ft. 6in. square, when faced with pure white paper, makes an ideal screen, where portability is not an object. If a larger screen is wanted then an oil flatted screen on rollers, not paper faced, will give the best results. Linen screens are very good for travelling, when a powerful illuminant is used, although there is always an enormous amount of light lost by transmission, or rather filtration, through them.

**Translucent
Screens.**

Translucent screens are not often met with nowadays, although in the earlier days of the phantasmagoria lantern they were very popular. For home use on a small scale, however, very brilliant effects may be obtained on a screen of tracing paper or tracing cloth, the lantern in this case being placed behind the screen. The transparency of the paper or cloth can be increased by oiling if greater brightness is desired. A large sheet of ground glass, supported in

a wooden frame, also gives a very brilliant and translucent picture. Transparent screens possess the drawback that those seated at an oblique angle to them cannot see the images effectively.

In working a large size disc it is often necessary to tilt the lantern in order to make the picture cover the screen, in which case the latter will require tilting to a corresponding angle in order to secure even definition.

**Home
Exhibitions.**

Lantern exhibitions may be divided into two classes, those given to the home circle, and public shows in the lecture hall. As this book has been written for the information of the beginner, who, if he wise, will not attempt a public exhibition until he has attained to some skill in the art of lantern projection, our attention will be practically confined to the manipulation of the lantern in the home.

**Position of the
Audience.**

As large a room as possible should be chosen for the exhibition, not because it permits of a larger picture being shown, but because the audience can be seated further from the screen, and so obtain a better view of the projected slides. Nothing is more uncomfortable and tiring than to sit too near the screen, and, as a matter of fact, those at the back of the room or hall generally see the pictures far better than those in the front rows.

Size of Picture.

It is a common mistake to show too large a picture, particularly if one of the more feeble illuminants is employed. A small picture well lighted, is infinitely more effective than a large one poorly lit. A 6 foot screen is quite large enough for

any room of ordinary dimensions, and it is by no means necessary to cover this with the picture. Most slides of any artistic pretensions are now masked with oblong openings, and if the position of the lantern is arranged so that the longer side of the projected image is about 4ft. 6in. or 5ft. in length the best possible effect will be obtained.

Factors Influencing the Size of the Picture.

The size of the picture is regulated by two factors, the distance of the lantern from the screen, and the focus of the lens. The further the lantern is moved from the screen the larger will be the image. With regard to the lens the longer its focus, working at any given distance from the screen, the smaller the picture, and *vice versa*. The lens usually supplied with lanterns of the ordinary type is of about $4\frac{1}{2}$ in. focus, which is too short, as it necessitates bringing the lantern too close to the screen to obtain a disc of moderate dimensions. Therefore, in buying a lantern stipulate for a lens of about $6\frac{1}{2}$ in. or 7in. focus.

Choice of Illuminant.

The reader will be governed in his choice of an illuminant by local circumstances, but if the electric current is available preference should be given to the Nernst lamp. It is an ideal illuminant for home use in the lantern and surpasses all others in convenience, comfort, and efficiency. Next in point of utility comes acetylene, which can be used anywhere in places where neither gas nor electricity are available, but it has the disadvantage that more trouble is involved in cleaning the apparatus after use, and this, if success is to be attained, *must* be attended to. After this comes the incandescent gas light, far more

feeble in luminosity, but clean and very little trouble. The spirit form of this light may also be used where house gas is not available. Lastly, we have the oil lamp, which, if of good construction, makes a capital illuminant if not unduly strained, by showing too large a picture. The heat evolved, however, is a drawback, as is also the trouble involved in thoroughly cleaning the lamp after use.

**The Lantern
Table or
Support.**

Lantern tripods are sold in the shops; studiously avoid them as traps for the unwary. An accidental kick or knock may easily upset the entire arrangement, with possibly disastrous results. A good firm table, with the lantern raised to the necessary height by placing it on the lantern box, will meet all requirements. But in making the final adjustments care must be taken to keep the lantern square with the screen, otherwise one side of the picture will be out of focus.

**How to Adjust
the Light.**

Directions for the manipulation of the various illuminants having already been given, it is not necessary to repeat them. It is assumed, therefore, that the lantern has been placed at the proper distance from the screen, and that the illuminant is working at its full intensity. If at this stage the cap is removed from the lens the disc will probably appear unevenly lighted. To obviate this the light must be centred. If dark patches appear on the screen move the light slowly up and down and from right to left until the centre of the disc shows clear and white, then clamp the light firmly in that position, with the clamp on the pin of the tray. At this stage the margins of the disc may still appear dark or unevenly lit. This

can be corrected by sliding the light nearer to or further from the condenser.

Necessary Precautions. It is a good plan, especially in frosty weather, to slightly warm the condenser at the fire before lighting up, the great heat from the illuminant on the cold surface of the glass sometimes causing fracture. It is unnecessary to add that both the condenser and the projecting lens must be kept clean and free from dust, a clean silk handkerchief being most suitable for the purpose.

To avoid Condensation. Sometimes when the atmosphere is damp moisture will condense on the slides during projection and quite spoil the effect. To avoid this remove the lid from the box containing them, and put them on the fender before an open fire about half an hour beforehand.

The slides are exhibited by means of what is known as a "carrier," of which there are many patterns, but for home use the ordinary sliding form will be found most useful. In this two slides are placed, with the dots or registration marks downwards, and next to the condenser. When one slide has been shown the carrier is pushed or slid forward, when the next comes into position, the one first shown being lifted out and replaced by a third.

Final Hints. One final hint; see that the room in which the exhibition is given is really dark. Nothing detracts so much from the brilliance or effect of the projected picture as extraneous light, from whatever source it may come. Sometimes the lantern, owing to faulty

construction, may allow light to pass out into the room; this defect should at once be remedied, of course taking due care to allow of sufficient ventilation. The incandescent electric light has one great advantage in this respect over other illuminants, in that it requires no ventilation and permits of the light being practically boxed in. The light of an ordinary fire may be quite sufficient to spoil the show, particularly if a weak illuminant is being used. If there be a fire in the grate the light from it should be effectually screened; the darker the room can be kept the better will be the effect upon the screen.



NEGATIVES FULL OF DETAIL
AND MOST SUITABLE FOR
LANTERN SLIDE MAKING
ARE EASILY OBTAINED

. . WITH . .



UNEQUALLED FOR
DEFINITION AND
COVERING POWER.

Write for free Booklet No. 91,

“What Can be Done with a Goerz Lens,”

. . TO . .

C. P. GOERZ,

1 to 6; Holborn Circus, London, E.C. ; or

THE STEREOSCOPIC CO., 106 and 108 Regent St., W., and 54 Cheapside, E.C.

“F O C U S”
 PHOTOGRAPHERS.

1d. EVERY WEDNESDAY. 1d.

GUARANTEED **25,000** CIRCULATION

Can be obtained from all Bookstalls, Newsagents,
 &c., or direct from the Publishers—

MARSHALL, BROOKES & CHALKLEY, Ltd.,
 Harp Alley, Farringdon St., London, E.C.

Why use GOLD when “SYNOLOIDS” do in 1 Minute what Gold Toning does in 45 P

“Synoloids”

(PATENTED THROUGHOUT THE WORLD.)

**Tablets for Developing P.O.P. (“Syno” P.O.P. recommended),
 1/6 per box of 24 Tablets, sufficient for 1 gross of 1/2-plate prints.**

“The operation is simplicity itself. . . . Fully toned and developed in 2 minutes.”—*Focus*.

“A new and important method of producing prints on P.O.P. . . . The tones obtained are really excellent. . . . The method of using ‘Synoloids’ is very simple. They are economical in use and singularly efficient. . . . They save a lot of time, and the washing before and after toning is entirely dispensed with.”—*The Amateur Photographer*.

“‘Synoloids,’ a substitute for Gold Toning, is another claimant for photographic favour, and its claims are borne out by our own experience. . . . ‘Synoloids’ and ‘Syno’ P.O.P. bid fair to become great favourites.”

—*The Photographic Monthly*.

“We can conceive no simpler method for the production of prints with all the attributes of the completely finished and toned results.”

—*British Journal of Photography*.

Send for Booklet (Gratis).

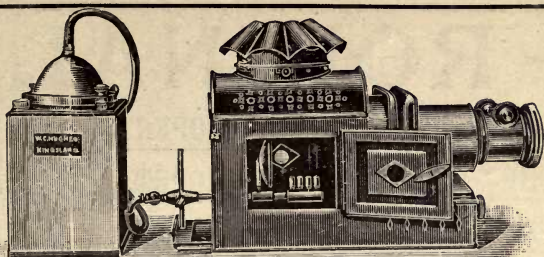
“SYNOLOIDS” and “SYNO” P.O.P.

OF ALL DEALERS, OR FROM

Messrs. Evans, Sons, Lescher & Webb, Ltd., 56, Hanover St., Liverpool.

Distributing Agents for

The “SYNOLOIDS” Co., Edinburgh.



THE PAMPHENGOS

Has a world-wide reputation as being the only Oil Lantern burning without smell or smoke, perfect combustion, and no broken glasses; reduced, ... **£3 5s. 0d.**

THE ACETYLENE PAMPHENGOS, with Portable Automatic Generator, 202 c.p., jet, tubing, pliers, spare burners, ready for use ... **£6 6s. 0d.**

Finest Lenses, 2 $\frac{1}{2}$ Open Stage, all vent system of ventilation. 4 $\frac{1}{2}$ in. Condensers.

HUGHES' BIJOU ENLARGER, with patent Rectangular Condensers, which give EQUAL illuminations, and have NO thin edges, $\frac{1}{2}$ -plate, **£5 5s.** $\frac{1}{4}$ -plate, **£8 8s.**

ALPHENGO REFLECTING ENLARGERS (no Condensers) are the Catch of the Season with Amateurs, $\frac{1}{4}$ -plate **20s.** $\frac{1}{2}$ -plate, **35s.**

Hughes' High Pressure 200 c.p. **SPIRIT MANTLE LAMP**, for Lanterns and Enlargers, no rubber parts, the newest illuminant, supercedes oil and acetylene, **35s.**

Lanterns and Apparatus, 6d. 100,000 slide list 6d. Cinematographs, 6d. Enlarging Apparatus and Tips, 3d.

W. C. HUGHES & Co.,

SPECIALISTS IN PROJECTION,

Brewster House, Mortimer Road, Kingsland, London, N.

The Watkins' methods ensure right exposure and development.

BEE METER, 2/7.

"Since using it I have not had a single failure due to incorrect exposure."

Queen Bee, 10/6.

Highest Finish.

WATKINS' MANUAL, 1/2.

(NEW EDITION).

Handbook of Factorial Development.

"Far and away the best shilling book on photography."

NEW DARK ROOM CLOCK, 10/6.

Large face, centre seconds hand, stop action.

Factorial Calculator, 2/1.

Pinhole Lens, 1/7.

Exposure Notes (new edition), 1/1.

Speed Card, 1 $\frac{1}{2}$ d.

All post free. Send for full list.

WATKINS' METER CO., Hereford.



— RODINAL —

THE UNIVERSAL DEVELOPER.

THE CLEANEST DEVELOPER.

3 oz. bottles **1/6**

THE SIMPLEST DEVELOPER.

8 oz. „ **3/-**

THE CHEAPEST DEVELOPER.

16 oz. „ **5/-**

THE STRONGEST DEVELOPER.

IS THE BEST FOR
**LANTERN SLIDES AND BROMIDE AND
GASLIGHT PAPERS.**

It does not fog, it does not stain, it does not clog the shadows.
It is always ready for use. It is only diluted with water.
It is one of the famous



DEVELOPERS.

If you insist on "AGFA" goods you will get the best.
METOL, AMIDOL, GLYCIN, PYRO, HYDROKINONE, ORTOL, IMOGEN
SULPHITE, EIKONOGEN and PARAMIDOPHENOL.

THE "AGFA" SPECIALITIES ARE:—

The 'Agfa' Acid Fixing Salt.

The 'Agfa' Intensifier.



The 'Agfa' Reducer.

The 'Agfa' Negative Varnish.

TRADE MARK.
The 'Agfa' Neutral Toning and Fixing Salts.

THE 'AGFA' FLASHLIGHT.

Little smoke.
Intense light. No dirt

Read the 'Agfa' Booklet. Free from your Dealer.

Sole Agents:—

CHAS. ZIMMERMANN & CO., 9 and 10
St. Mary-at-Hill, E.C.

RETURN CIRCULATION DEPARTMENT**TO** → 202 Main Library

642-3403

LOAN PERIOD 1	2	3
4	5	6

LIBRARY USE

This book is due before closing time on the last date stamped below

DUE AS STAMPED BELOW

LIBRARY	USE	APR 28 1978
REC. CIRC.	APR 28 '78	
SENT ON ILL		
FEB 08 2001		
U. C. BERKELEY		
4/05/02		

UNIVERSITY OF CALIFC

FORM NO. DD6A, 8m, 4'77

BERKELEY, CA 947

LD 21-100m-7,'33

YB 11157

TR730
H6

370890

Hodges

UNIVERSITY OF CALIFORNIA LIBRARY

BARNET ORTHO PLATES

Provide the best means for
obtaining perfect negatives
suitable for Lantern Work.
They give a clear, bright
image with full detail in the
▢ ▢ ▢ shadows. ▢ ▢ ▢

BARNET LANTERN PLATES

Give warm or cold tones at
will. Full instructions en-
closed in every packet,
1/- PER DOZEN.

Made by
ELLIOTT & SONS, LTD
BARNET, HERTS.

CHARLES H. PEARSON

MENTION "FOCUS MANUALS."